

## Remarks

### The Rejection of Claims 1-3, 6, 15-16, and 18-20 under 35 U.S.C. §103(a)

In Section 5, the Examiner rejected the above-identified claims under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,588,050 (Urban), of record, in view of U.S. Patent No. 4,081,307 (Morgan, Jr.), newly cited. Applicant traverses the rejection and respectfully requests reconsideration.

The Office Action states that the principal reference to Urban discloses the invention substantially as claimed with the exception of the feature of Claims 1, 15, and 18 directed to fabricating the attachment rigid structure 34 of friction material. Further, the Office Action states: "It would have been obvious at the time the invention was made to one having ordinary skill in the art to which the invention pertains to modify the principal reference to Urban to make the material of the attachment structure 34 of softer material, i.e., friction material, as opposed to conventional harder material as taught by Morgan, Jr...."

The Office Action also states: "The secondary reference to Morgan, Jr. teaches making the material which is used to attach a pad to a backing plate with softer material to avoid or at least minimize scoring of the brake drum or brake rotor by conventional hard metallic rivets or the like."

An invention is unpatentable if the differences between it and the prior art would have been obvious at the time of the invention. As stated in MPEP § 2143, there are three requirements to establish a *prima facie* case of obviousness.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck* 947 F.2d 488, 20 USPQ2d, 1438 (Fed. Cir. 1991).

There is no suggestion, motivation, or teaching in Morgan, Jr. to modify Urban to form the claimed invention. The Applicant respectfully disagrees with the Examiner's statement that Morgan, Jr. teaches the use of conventional harder material for an attachment structure. In col. 1, lines 19-21,

Morgan, Jr. states: "It has been most usual, throughout the history of the automobile, that these linings be fastened to the brake shoe by *rivets made of copper or brass* (emphasis added)." In col. 1, lines 24 and 25, Morgan, Jr. states: "Even though the rivets were made of *a relatively soft material* (emphasis added), it was still possible that the wear surface of the drum would be scored by the rivets as the linings wore away." Thus, Morgan, Jr. is teaching the use of soft materials to fasten brake linings, contrary to the above-referenced statement from the Office Action. To further clarify his definitions of soft and hard materials, in col. 1, lines 11-13, Morgan, Jr. states: "For many years brake linings, formed of *a relatively hard, long-wearing friction material*, (emphasis added) have been applied to brake shoes..." Thus, Morgan, Jr. defines friction material as "hard" contrary to the above-referenced statement from the Office Action. Therefore, Morgan, Jr. teaches that brake linings are made of frictional materials that he defines as hard and that these linings are fastened using soft materials. That is, Morgan, Jr. is teaching away from the use of frictional materials to fasten brake linings.

The Applicant notes that in the Office Action, the Examiner has added the word "eventually" after "were" to the reproduction of the following sentence included in the Office Action and taken from Morgan, Jr.: "Even though the rivets were made of a relatively soft material, it was still possible that the wear surface of the drum would be scored by the rivets as the linings wore away." The Applicant can find no basis for this addition. Morgan, Jr. contains no information regarding a progression of metal types for rivets and only mentions rivets made of "soft material," i.e., copper or brass.

Morgan, Jr. teaches that the use of a "soft material," i.e., copper or brass, does not provide a solution to the problem of scoring a drum surface, as shown in the previous paragraph. Since he has already taught that the use of soft materials does not solve the scoring problem, Morgan, Jr.'s characterization of frictional material as hard further teaches away from the use of a frictional material to hold a pad. Further, Morgan, Jr. teaches away from the use of mechanical fasteners, such as rivets, regardless of the composition of the fasteners. In col. 1, lines 33-35, Morgan, Jr. states: "In recent years, while riveted linings are still in use, it has been the practice to bond brake linings by an adhesive to the brake shoe. Thus no rivets were used and the linings can be used to a greater percentage of the total thickness without danger of damage to the brake drums." Thus, Morgan, Jr. provides no suggestion or motivation to use rivets and instead, teaches the use of adhesive bonding.

That is, Morgan, Jr. cites the use of rivets as a problem to be solved by bonding.

Further still, the Examiner has not demonstrated that the modification of the cited prior art reference points to the reasonable expectation of success in the present invention, which is the second requirement of the obviousness analysis. Morgan, Jr. teaches that the use of rivets, and by association, mechanical fasteners in general, is not a desirable or successful approach. He notes that the practice of riveting has been largely replaced by bonding, which he describes as a successful and desirable approach. Morgan, Jr. also teaches that the use of frictional materials for attaching brake linings is not an expected avenue of success since he defines such materials as being “hard” and he teaches that even “soft” materials cause scoring problems.

With respect to the third requirement to support a *prima facie* case of obviousness, Urban and Morgan, Jr. do not teach nor suggest all the claim limitations. Urban makes no suggestion or teaching to use a frictional material to hold a brake liner. As noted above, Morgan, Jr. teaches away from using mechanical fasteners. When he does consider such fasteners, he notes that the fasteners are made of a “relatively soft material,” which excludes frictional material, which he defines as a “relatively hard material.” The combination of Urban with Morgan, Jr. does not recite the features of the invention of Claims 1, 15, and 18. Claims 2, 3, and 6, dependent from Claim 1, also benefit from the above-mentioned distinctions. Claim 16, dependent from Claim 15, also benefits from the above-mentioned distinctions. Claims 19 and 20, dependent from Claim 18, also benefit from the above-mentioned distinctions. Since the combination of Urban and Morgan, Jr. neither suggests, nor contains all the elements of the claimed invention, the Examiner is requested to withdraw the rejection.

#### The Rejection of Claims 17 and 21 under 35 U.S.C. §103(a)

In Section 6, the Examiner rejected the above-identified claims under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,588,050 (Urban) in view of U.S. Patent No. 4,081,307 (Morgan, Jr.) as applied to claims 15 and 18 in Section 5, and further, in view of U.S. Patent No. 5,601,174 (Schultz). Applicant traverses the rejection and respectfully requests reconsideration.

The Applicant respectfully submits that, as shown above, the combination of Urban with Morgan, Jr. does not recite the features of the invention of Claims 1, 15, and 18. Claim 17, dependent from Claim 15, also benefits from the above-mentioned distinctions. Claim 21, dependent

from Claim 18, also benefits from the above-mentioned distinctions. Since the combination of Urban and Morgan, Jr. further in view of Schultz neither suggests, nor contains all the elements of the claimed invention, the Examiner is requested to withdraw the rejection.

The Rejection of Claims 1-3, 6, 15-16, and 18-20 under 35 U.S.C. §103(a)

In Section 7, the Examiner rejected the above-identified claims under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,588,050 (Urban), of record, in view of U.S. Patent No. 5,984,055 (Strasser, et al.), newly cited. Applicant traverses the rejection and respectfully requests reconsideration.

The Office Action states that the principal reference to Urban discloses the invention substantially as claimed with the exception of the feature of Claims 1, 15, and 18 directed to fabricating the attachment rigid structure 34 of friction material. Further, the Office Action states that it would be obvious to modify Urban to make the material of the attachment structure 34 of softer material, i.e., friction material, as opposed to conventional harder material as taught by Strasser.

The Office Action also states: "The secondary reference to Strasser, et al. teaches making the material which is used to attach a pad to a backing plate with friction material to avoid scoring of the brake rotor when the lining attachment portions 46 contact the brake rotor."

Regarding the first requirement to establish a *prima facie* case of obviousness, there is no suggestion, motivation, or teaching in Strasser, to modify Urban to form the claimed invention. Regarding the Examiner's above statement regarding portions 46 and scoring of the brake rotor, the Applicant can find no direct or inferential statement in Strasser regarding the problem of the portions 46 contacting the brake rotor.

In addition, the Applicant respectfully disagrees with the Examiner that Strassner suggests or motivates the use of a friction material to attach a pad to a backing plate. For example, in col. 2, lines 56 and 57, Strasser, referring to a co-pending application, states: "The previously disclosed approach involved casting a metal back plate onto a FRCMC brake pad." Then, in col 3, lines 3-5, Strassner states: "However, even though this casting method worked well, it has been found to be relatively expensive and cost prohibitive for mass production." Thus, Strasser is teaching that the use of a cast metal (hard) material is a very successful approach functionally. That is, Strassner is

teaching away from the use of a friction material to attach a brake pad by reciting the use of a cast metal to hold a back pad in place.

Strasser teaches a fiber reinforced ceramic matrix composite (FRCMC) integrated brake pad (friction material) and a FRCMC back plate, having different compositions and physical attributes. The Applicant respectfully submits that Strasser very clearly distinguishes between the materials used in the pad and the back plate and thereby teaches against interchanging these materials. In col. 3, lines 46-51, Strasser states: "The first FRCMC material used in the brake pad section includes a pre-ceramic resin in its ceramic state, fibers and possibly a filler material. The types and amount of these constituents are generally chosen so as to impart characteristics desirable in brake pads, such as high temperature and erosion resistance, and a high coefficient of friction." Then, in col. 4, lines 15-20, Strasser states: "The second FRCMC material used in the back plate section includes a pre-ceramic resin in its ceramic state and fibers. In this case, the types and amounts of these constituents are generally chosen to impart the strength to the back plate section necessary to withstand compressive and bending forces placed upon it during braking." Note that in the description of the second FRCMC material, no mention is made of critical frictional material parameters, such as a high coefficient of friction.

Further, in col. 3, lines 58-60, Strasser describes the brake pad component fibers thusly: "These fibers are in the form of non-continuous, loose fibers having lengths of about 0.2 to 5.0 inches depending on the size of the brake pad." By comparison, in col. 4, lines 27-33, Strasser states: "However, in the case of the back plate section, the fibers take the form of at least one sheet of woven continuous fibers, where the fibers are oriented in the longitudinal direction of the back plate. Such a longitudinal orientation optimizes the back plate's resistance to bending under the aforementioned bending forces imposed on it during braking." Thus, Strasser is further differentiating between the materials used to form the brake pad and the back plate portion.

Strasser only mentions rivets as a problem to be solved by his invention. For example, in col. 2, lines 11-15, Strasser states: "Typically, brake pads are riveted to the back plate to form the brake pad and back plate assembly. However, *a common problem with this type of assembly* (emphasis added) is the incidence of the rivets "scoring" the brake rotors when the brake pads wear down too far past the point of needing replacement." Strasser makes no suggestion, explicit or implicit, to use alternate materials for the rivets. In fact, Strasser teaches away from the use of

mechanical fasteners by presenting the FRCMC pad and backing plate.

Further, the Examiner has not demonstrated that the modification of the cited prior art reference points to the reasonable expectation of success in the present invention, which is the second requirement of the obviousness analysis. In col. 3, lines 6 through 9, Strasser states: "Accordingly, there is a need for brake pad and back plate assembly that does not require the use of rivets or adhesives to attach the brake pad to the back plate, *thereby avoiding the problems associated with each attachment system* (emphasis added)." Thus, Strasser clearly points away from any expectations of success using a rivet, i.e., mechanical fastener.

With respect to the third requirement to support a *prima facie* case of obviousness, Urban and Strasser do not teach nor suggest all the claim limitations. Urban makes no suggestion or teaching to use a frictional material to hold a brake liner. As noted above, Strasser does not teach the use of a friction material to secure a brake pad to a back plate. The combination of Urban with Strasser does not recite the features of the invention of Claims 1, 15, and 18. Claims 2, 3, and 6, dependent from Claim 1, also benefit from the above-mentioned distinctions. Claim 16, dependent from Claim 15, also benefits from the above-mentioned distinctions. Claims 19 and 20, dependent from Claim 18, also benefit from the above-mentioned distinctions. Since the combination of Urban and Strasser neither suggests, nor contains all the elements of the claimed invention, the Examiner is requested to withdraw the rejection.

#### The Rejection of Claims 17 and 21 under 35 U.S.C. §103(a)

In Section 8, the Examiner rejected the above-identified claims under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,588,050 (Urban) in view of U.S. Patent No. 5,984,055 (Strasser, et al.) as applied to claims 15 and 18 in Section 7, and further, in view of U.S. Patent No. 5,601,174 (Schultz.). Applicant traverses the rejection and respectfully requests reconsideration.

The Applicant respectfully submits that, as shown above, the combination of Urban with Strasser does not recite the features of the invention of Claims 1, 15, and 18. Claim 17, dependent from Claim 15, also benefits from the above-mentioned distinctions. Claim 21, dependent from Claim 18, also benefits from the above-mentioned distinctions. Since the combination of Urban and Strasser further in view of Schultz neither suggest, nor contains all the elements of the claimed invention, the Examiner is requested to withdraw the rejection.

**Conclusion**

Applicant respectfully submits that the present application is now in condition for allowance, which action is courteously requested.

Respectfully submitted,



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